

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

18

To:

BERESKIN & PARR
40 King Street West, 40th Floor
TORONTO, ONTARIO M5H 3Y2
CANADA

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BERESKIN & PARR

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year)

07.11.2001

Applicant's or agent's file reference
4320-189

IMPORTANT NOTIFICATION

International application No.
PCT/CA00/00876

International filing date (day/month/year)
27/07/2000

Priority date (day/month/year)
29/07/1999

Applicant

ZENON ENVIRONMENTAL INC.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



European Patent Office - P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk - Pays Bas
Tel. +31 70 340 - 2040 Tx: 31 651 epo nl
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Dekker, M

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)


Applicant's or agent's file reference 4320-189	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/CA00/00876	International filing date (day/month/year) 27/07/2000	Priority date (day/month/year) 29/07/1999
International Patent Classification (IPC) or national classification and IPC B01D65/00		
Applicant ZENON ENVIRONMENTAL INC.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.
 - ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 08/02/2001	Date of completion of this report 07.11.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer Hoornaert, P Telephone No. +31 70 340 2323



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CA00/00876

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):
- Description, pages:**

1-20 as originally filed

Claims, No.:

1-26 as originally filed

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CA00/00876

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 7-16, 17 and 18 (insofar as claims 17 and 18 relate to claims 7-16), and 19-26.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the said claims Nos. 7-16, 17 and 18 (insofar as claims 17 and 18 relate to claims 7-16), and 19-26 (in response to non-unity specification, no acquired additional fees were paid).

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CA00/00876

Novelty (N)	Yes:	Claims	1-6,17,18
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-6,17,18
Industrial applicability (IA)	Yes:	Claims	1-6,17,18
	No:	Claims	

2. Citations and explanations
see separate sheet

Re Item V

1. Reference is made to the following documents:

D2: PATENT ABSTRACTS OF JAPAN vol. 1996, no. 08, 30 August 1996 (1996-08-30) -& JP 08 099025 A (KUBOTA CORP), 16 April 1996 (1996-04-16) -& DATABASE WPI Derwent Publications Ltd., London, GB; AN 1996-246157 XP002153127

D3: US-A-5 647 988 (SHIOYAMA MASAHIKO ET AL) 15 July 1997 (1997-07-15)

D7: US-A-5 403 479 (SMITH BRADLEY M ET AL) 4 April 1995 (1995-04-04) cited in the application

- 2.1 D3 (see abstract; claims 1, 2 and 5; figures; column 1, line 1 - column 3, line 26; column 3, lines 47-49; examples 1-4; column 9, line 43 - column 10, line 1) discloses a method for cleaning one or more membranes normally immersed in a water rich in solids and used to permeate a water lean in solids comprising: performing cleaning events, each cleaning event having the steps of:
- (a) stopping permeation;
 - (b) flowing a selected concentration of a chemical cleaner through the membranes in a direction opposite to the direction in which permeate normally passes through the membranes to provide chemical cleaner in an area in or adjacent the membranes for a selected duration; and,
 - (c) resuming permeation.

The chemical backwashing is carried out with a NaOCl solution having an available chlorine concentration of 10 mg/l to 10^3 mg/l, e.g. 100 mg/l either for a predetermined time period and at a predetermined frequency, or otherwise for an appropriate time period and at an appropriate time which are determined on the basis of a transmembrane pressure, suction pressure or filtrate flux.

As in the method of the present invention, chemical backwashing in D3 is performed in addition to regular periodic backwashing with water (permeate). According to the first method of D3, the frequency ratio of normal regular water backwashing to chemical backwashing is at least 2 to 1. The time period of the chemical backwashing is between 10 seconds and 5 minutes. The supplied chemical cleaner is retained for an appropriate time period to be permeated

through the membrane and chemically removing deposit adhering to the membrane.

It can be derived directly and unambiguously from figure 2 of D3, that cleaning according to the first method of D3 results in a slow acceptable decline in permeability of the membranes over an extended period of time. It is clear that no intensive recovery cleaning is carried out.

- 2.2 The subject-matter of claim 1 differs only from the method of D3, which is considered to represent the most relevant state of the art for that claim, in that it has not been mentioned explicitly in D3 that the cleaning events are performed at least once a week, and that the product of the concentration of the chemical cleaner expressed as an equivalent concentration of NaOCl in cleaning efficacy and the duration of all cleaning events in a week is between 2,000 minutes.mg/L and 30,000 minutes.mg/L.

The subject-matter of independent claim 1 is thus novel with respect to D3 (Art. 33(2) PCT).

- 2.3 However, it is clear that the inventors of D3 addressed the same technical problems as those alleged by the present applicant, i.e. to avoid excessive chemical washing (intensive recovery cleaning) and to reduce the amount of chemical cleaner to be used for backwashing (compare D3, column 9, lines 49-53 to present application, page 3, lines 7-17, page 11, lines 13-23, and page 15, lines 11-14).

No objectively defined technical problem is thus solved **having regard to the closest prior art, D3**, by the distinguishing features identified under point 2.2 above. In the absence of any apparent technical effect or advantage, the problem might possibly be regarded as simply to provide an alternative method, which would however not be inventive, being rather a matter of technical equivalence, the method differing in detail, but not in function or efficiency.

The subject-matter of claim 1 does therefore not involve an inventive step (Article 33(3) PCT).

3. The same arguments as mentioned under points 2.1 - 2.3 above apply *mutatis*

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/CA00/00876

mutandis to D2 (see passages as highlighted in the Search Report, in particular, paragraphs [0014] to [0018] and table 1 of the computer translated document).

4. Dependent claims 2-6, 17 and 18 do not add any further inventive features (see e.g. D2 for claims 5 and 6, D3 for claim 5 and D7 for claim 17).

PATENT COOPERATION TREATY

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DEC 04 2000

PCT BERESKIN & PARR

From the INTERNATIONAL SEARCHING AUTHORITY

To:
BERESKIN & PARR
40 King Street West, 40th Floor
TORONTO, ONTARIO M5H 3Y2
CANADA

INVITATION TO PAY ADDITIONAL FEES

(PCT Article 17(3)(a) and Rule 40.1)

Date of mailing (day/month/year) 01/12/2000	
Applicant's or agent's file reference 4320-189	PAYMENT DUE within 45 105 days/days from the above date of mailing
International application No. PCT/CA 00/00876	International filing date (day/month/year) 27/07/2000
Applicant ZENON ENVIRONMENTAL INC.	

1. This International Searching Authority

- (i) considers that there are 4 (number of) inventions claimed in the international application covered by the claims indicated ~~below~~ on the extra sheet:

and it considers that the international application does not comply with the requirements of unity of invention (Rules 13.1, 13.2 and 13.3) for the reasons indicated ~~below~~ on the extra sheet:

- (ii) ☒ has carried out a partial international search (see Annex) ☐ will establish the international search report on those parts of the international application which relate to the invention first mentioned in claims Nos.:

See extra sheet subject 1

- (iii) will establish the international search report on the other parts of the international application only if, and to the extent to which, additional fees are paid


2. The applicant is hereby invited, within the time limit indicated above, to pay the amount indicated below:

DEM 1.848,26 x 3 = DEM 5.544,78
Fee per additional invention number of additional inventions total amount of additional fees

Or, EUR 945,00 x 3 = EUR 2.835,00

The applicant is informed that, according to Rule 40.2(c), the payment of any additional fee may be made under protest, i.e., a reasoned statement to the effect that the international application complies with the requirement of unity of invention or that the amount of the required additional fee is excessive.

3. ☐ Claim(s) Nos. _____ have been found to be unsearchable under Article 17(2)(b) because of defects under Article 17(2)(a) and therefore have not been included with any invention.

Name and mailing address of the International Searching Authority  European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Toñi Muñoz-Manneken
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This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-6,
17 and 18 (insofar as claims 17 and 18 are dependent on claim 1)

Method for cleaning membranes normally immersed in a water rich in solids comprising performing cleaning events at least once a week, each cleaning event having a step of flowing a chemical cleaner through the membranes in a direction opposite to normal permeate direction, wherein the product of the concentration of the chemical cleaner and the duration of all cleaning events during a week (weekly CT) is between 2,000 and 30,000 minutes.mg/L (expressed as equivalent concentration in NaOCl).

2. Claims: 7-15,
17 and 18 (insofar as claims 17 and 18 are dependent on claim 7)

Process for separating solids lean permeate from a solids rich water tank including immersing vertically oriented filtering hollow fibre membranes in a tank of solids rich water comprising cleaning the membranes in cleaning events comprising a step of flowing a chemical cleaner through the membranes in a direction opposite to the normal permeate direction in repeated pulses without draining the tank.

3. Claims: 16-18

Method for cleaning membranes immersed in a water rich in solids comprising performing cleaning events, each cleaning event comprising the steps of stopping permeation and agitation, flowing a chemical cleaner through the membranes in a direction opposite to normal permeate direction, resuming permeation, and resuming agitation while the membranes remain immersed.

4. Claims: 19-26

Method for cleaning membranes used to filter water containing solids comprising cleaning events wherein water heated to at least 25°C or steam is flowed through the membranes in a direction opposite to the normal permeate direction.

Specification according to Rule 40.1 PCT of the reasons for which the present international application is a posteriori not considered as complying with the requirement of unity of invention according to Rule 13.1, 13.2 and 13.3 PCT.

1) According to the Administrative Instructions under the PCT, as in force from July 1, 1998 (see special issue of the PCT Gazette, Section IV, Annex B, Part 1(c)), unity of invention has to be considered in the first place only in relation to the independent claims.

The application has the following four (4) independent claims:

-(1) Independent claim 1 is directed to a method for cleaning membranes normally immersed in a water rich in solids comprising performing cleaning events at least once a week, each cleaning event having a step of flowing a chemical cleaner through the membranes in a direction opposite to normal permeate direction, wherein the product of the concentration of the chemical cleaner and the duration of all cleaning events during a week (weekly CT) is between 2,000 and 30,000 minutes.mg/L (expressed as equivalent concentration in NaOCl).

The problem to be solved by independent claim 1 is to reduce the frequency of intensive recovery chemical cleanings (see description, page 11 lines 13-17) by applying regular maintenance cleaning.

-(2) Independent claim 7 is directed to a process for separating solids lean permeate from a solids rich water tank including immersing vertically oriented filtering hollow fibre membranes in a tank of solids rich water comprising cleaning the membranes in cleaning events comprising a step of flowing a chemical cleaner through the membranes in a direction opposite to the normal permeate direction in repeated pulses without draining the tank.

The problems to be solved by independent claim 7 are to allow the use of the permeate pump to deliver the chemical cleaner, and to obtain a better distribution of cleaning chemical (see description, page 13 lines 7-25).

-(3) Independent claim 16 is directed to a method for cleaning membranes immersed in a water rich in solids comprising performing cleaning events, each cleaning event comprising the steps of stopping permeation and agitation, flowing a chemical cleaner through the membranes in a direction opposite to normal permeate direction, resuming permeation, and resuming agitation while the membranes remain immersed.

The problem to be solved by independent claim 16 is to obtain efficient cleaning while reducing the amount of chemical cleaner entering the tank (see description, page 9 line 27 - page 10 line 4, and page 10 lines 25-30).

-(4) Independent claim 19 is directed to a method for cleaning membranes used to filter water containing solids comprising cleaning events wherein water heated to at least 25°C or steam is flowed through the membranes in a direction opposite to the normal permeate direction.

The problem to be solved by independent claim 19 is to provide a cleaning method capable of removing organic matter from membranes while avoiding the use of a chemical cleaner and the disadvantages bound up therewith (see description, page 16 line 20 - page 17 line 4).

2) The only common technical features present in all the independent claims are the cleaning of one or more membranes used to filter water containing solids to produce a permeate in cleaning events wherein the permeation is stopped, a cleaning liquid is flowed through the membranes in a direction opposite to normal permeate direction, and permeation is resumed.

These features correspond to normal backwashing of membranes used for water filtration and are well-known in the art.

Furthermore, the subject-matter of independent claim 19 is not novel over JP 10 192850 A (= D1)(Kurita Water Ind. Ltd, published on 28.07.1998, corresponding to Patent Abstracts of Japan, vol. 98, no. 12, 31.10.1998 and to Derwent Abstract no. 1998-460881). D1 (not cited in the International Search Report) (see figure 1, abstracts mentioned above, and paragraphs '0001! to '0012!, '0021! to '0025! and '0028! to '0032!) discloses a method for cleaning membranes used for filtering water (service water, ground water, waste water) comprising cleaning events comprising stopping permeation (valves 3 and 9 cut connection between pipes 2 and 4, respectively pipes 7 and 10 of membrane module 50), backwashing with water heated to 40-85°C, and resuming permeation.

As a consequence of said novelty objection against independent claim 19, no common special technical features within the meaning of Rule 13.2 PCT (i.e. novel and inventive) exist between the above mentioned independent claims.

3) It is clear that the problem to be solved by independent claim 19 is e.g. also solved by the method according to document D1 and thus no COMMON problem is solved by all of the above mentioned independent claims, which is different from that solved by novelty destroying document D1.

On its own therefore said effect (problem) cannot contribute to the prior art and form any single inventive concept.

4) Consequently, no single general inventive concept as required by Rule 13.1 PCT exists between the above mentioned independent claims and, in a first stage, two different groups of inventions can be identified:

-Group A: independent claims 1, 7 and 16 and their dependent claims.

-Group B: independent claim 19 and dependent claims 20-26.

5) Considering group A, the only common technical features present in all the independent claims of said group are the cleaning of one or more membranes immersed in water rich in solids to produce a permeate lean in solids in cleaning events wherein the permeation is stopped, a chemical cleaner is flowed through the membranes in a direction opposite to normal permeate direction, and permeation is resumed. In this connection, it is pointed out that according to claim 1 it is not necessary that the membranes remain immersed in the water to be treated during cleaning (see description, page 16 lines 6-8).

These features correspond to normal chemical backwashing of membranes

used for filtering water rich in solids and normally immersed in said water are well-known in the art, in particular, said features are disclosed in the following documents cited in the International Search Report:

- JP 08 099025 A (= D2)
- US 4 647 988 A (= D3)
- JP 11 128920 A (= D4)
- JP 10 066844 A (= D5)
- JP 08 229362 A (= D6), and
- US 5 403 479 A (= D7) (also cited in the application).

Consequently, no common special technical features within the meaning of Rule 13.2 PCT (i.e. novel and inventive) exist between the independent claims 1, 7 and 16 of group A.

6) The only COMMON problem which can be derived from the problems to be solved by independent claims 1, 7 and 16 (see points 1) (1), (2) and (3) above) of group A is to provide an efficient chemical cleaning method for normally immersed membranes which reduces the amount of chemical cleaner used and thus reduces the impact on the microorganisms in the tank and of the residual concentration of chemical cleaner in the permeate (see description, page 3 lines 7-17).

It is clear that said common problem is e.g. also solved by each of the methods according to documents D2 (see paragraphs '0010! and '0014! to '0016! and table 1), D3 (see column 4 line 66 to column 5 line 65, and column 9 line 49 to column 10 line 9), D4 (see paragraphs '0022! to '0025!, D5 (see paragraphs '0007! to '0011!, D6 (see paragraph '0006!, and D7 (see column 11 lines 22-61). Thus no COMMON problem is solved by all of the above mentioned independent claims of group A, which is different from that solved by each of the documents D2-D7.

On its own therefore said effect (problem) cannot contribute to the prior art and form any single inventive concept.

7) Consequently, in a final stage, no single general inventive concept as required by Rule 13.1 PCT exists between the different groups of inventions 1-4 as identified above.

8) According to Art. 17(3)(a) PCT a search has been performed for the invention first mentioned in the claims (main invention), i.e. the subject matter of the claims mentioned under group 1 as identified above.

Ann x to Form PCT/ISA/206
COMMUNICATION RELATING TO THE RESULTS
OF THE PARTIAL INTERNATIONAL SEARCH

International Application No
PCT/CA 00/00876

1. The present communication is an Annex to the invitation to pay additional fees (Form PCT/ISA/206). It shows the results of the international search established on the parts of the international application which relate to the invention first mentioned in claims Nos.:
- see 'Invitation to pay additional fees'
2. This communication is not the international search report which will be established according to Article 18 and Rule 43.
3. If the applicant does not pay any additional search fees, the information appearing in this communication will be considered as the result of the international search and will be included as such in the international search report.
4. If the applicant pays additional fees, the international search report will contain both the information appearing in this communication and the results of the international search on other parts of the international application for which such fees will have been paid.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 08, 30 August 1996 (1996-08-30) -& JP 08 099025 A (KUBOTA CORP), 16 April 1996 (1996-04-16) abstract; figures; table 1 paragraphs '0010!,'0014!-'0017! -& DATABASE WPI Derwent Publications Ltd., London, GB; AN 1996-246157 XP002153127 abstract	1,5,6
A	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 08, 29 September 1995 (1995-09-29) -& JP 07 136474 A (DAICEL CHEM IND LTD), 30 May 1995 (1995-05-30) abstract; claim 1; table 1 paragraphs '0004!-'0009! -& DATABASE WPI Derwent Publications Ltd., London, GB; AN 1995-227562 XP002153128 abstract	1



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

* & * document member of the same patent family

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 647 988 A (SHIOYAMA MASAHIKO ET AL) 15 July 1997 (1997-07-15) abstract; figures column 1, line 1 -column 3, line 26 column 4, line 13 -column 5, line 65 column 9, line 49 -column 10, line 9 ---	1,5
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 10, 31 August 1999 (1999-08-31) -& JP 11 128920 A (KUBOTA CORP), 18 May 1999 (1999-05-18) abstract; figures paragraphs '0006!,'0012!,'0019!-'0025! -& DATABASE WPI Derwent Publications Ltd., London, GB; AN 1999-351261 XP002153129 abstract ---	1,5
A	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 08, 30 June 1998 (1998-06-30) -& JP 10 066844 A (KUBOTA CORP), 10 March 1998 (1998-03-10) abstract; figures paragraphs '0007!-'0011! -& DATABASE WPI Derwent Publications Ltd., London, GB; AN 1998-224545 XP002153130 abstract ---	1,5
A	PATENT ABSTRACTS OF JAPAN vol. 1997, no. 01, 31 January 1997 (1997-01-31) -& JP 08 229362 A (OZAWA GENZO;MAEZAWA IND INC), 10 September 1996 (1996-09-10) abstract; figures paragraphs '0006!-'0013!,'0022!-'0025! -& DATABASE WPI Derwent Publications Ltd., London, GB; AN 1996-459628 XP002153131 abstract --- -/--	1,5

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>US 5 403 479 A (SMITH BRADLEY M ET AL) 4 April 1995 (1995-04-04) cited in the application abstract; figures column 5, line 10 - line 41 column 5, line 60 -column 6, line 34 column 11, line 21 - line 61 column 14, line 6 - line 40 column 15, line 27 - line 47 column 17, line 1 -column 18, line 66</p> <p align="center">---</p>	1,5,17
A	<p>PATENT ABSTRACTS OF JAPAN vol. 1999, no. 04, 30 April 1999 (1999-04-30) -& JP 11 019488 A (HITACHI ZOSEN CORP), 26 January 1999 (1999-01-26) abstract; figures -& DATABASE WPI Derwent Publications Ltd., London, GB; AN 1999-169920 XP002153132 abstract</p> <p align="center">---</p>	1,5
A	<p>PATENT ABSTRACTS OF JAPAN vol. 016, no. 400 (C-0977), 25 August 1992 (1992-08-25) -& JP 04 131182 A (EBARA INFILCO CO LTD;OTHERS: 01), 1 May 1992 (1992-05-01) abstract; figures & DATABASE WPI Derwent Publications Ltd., London, GB; AN 1992-197461 abstract</p> <p align="center">---</p>	1,5
A	<p>PATENT ABSTRACTS OF JAPAN vol. 1995, no. 08, 29 September 1995 (1995-09-29) -& JP 07 116482 A (KURITA WATER IND LTD), 9 May 1995 (1995-05-09) abstract; figures paragraph '0003! -& DATABASE WPI Derwent Publications Ltd., London, GB; AN 1995-203022 XP002153133 abstract</p> <p align="center">-----</p>	1,5

Patent Family Annex

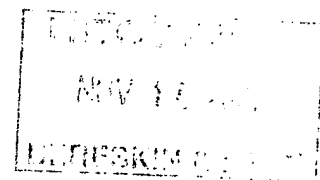
Information on patent family members

International Application No

PCT/CA 00/00876

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 08099025 A	16-04-1996	NONE	
JP 07136474 A	30-05-1995	NONE	
US 5647988 A	15-07-1997	JP 7313850 A AU 683939 B AU 7884094 A DE 4445682 A	05-12-1995 27-11-1997 07-12-1995 07-12-1995
JP 11128920 A	18-05-1999	NONE	
JP 10066844 A	10-03-1998	NONE	
JP 08229362 A	10-09-1996	NONE	
US 5403479 A	04-04-1995	AU 1269795 A WO 9517241 A DE 69412647 D DE 69412647 T EP 0738180 A	10-07-1995 29-06-1995 24-09-1998 01-04-1999 23-10-1996
JP 11019488 A	26-01-1999	NONE	
JP 04131182 A	01-05-1992	JP 6065371 B	24-08-1994
JP 07116482 A	09-05-1995	NONE	

PATENT COOPERATION TREATY



From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Rule 71.1)

To:

BERESKIN & PARR
40 King Street West, 40th Floor
TORONTO, ONTARIO M5H 3Y2
CANADA

Date of mailing (day/month/year)	02.11.2001
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Applicant's or agent's file reference 4320-86	IMPORTANT NOTIFICATION
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International application No. PCT/CA00/00875	International filing date (day/month/year) 27/07/2000	Priority date (day/month/year) 29/07/1999
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Applicant ZENON ENVIRONMENTAL INC. et al.
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1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

<p>Name and mailing address of the IPEA/</p> <div style="display: flex; align-items: center;"> <div> <p>European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016</p> </div> </div>	<p>Authorized officer</p> <p>Dekker, M</p> <p>Tel.+31 70 340-4046</p> <div style="text-align: right;"> </div>
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 4320-86	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/CA00/00875	International filing date (<i>day/month/year</i>) 27/07/2000	Priority date (<i>day/month/year</i>) 29/07/1999	
International Patent Classification (IPC) or national classification and IPC B01D65/02			
Applicant ZENON ENVIRONMENTAL INC. et al.			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 7 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 15/12/2000	Date of completion of this report 02.11.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer Hoornaert, P Telephone No. +31 70 340 2323



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CA00/00875

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-17 as originally filed

Claims, No.:

1-17 as originally filed

Drawings, sheets:

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CA00/00875

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
☐ paid additional fees.
☐ paid additional fees under protest.
☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
☐ the parts relating to claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	2,3,6,7,9,11,14-17
	No:	Claims	1,4,5,8,10,12,13
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-17

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CA00/00875

Industrial applicability (IA)	Yes:	Claims	1-17
	No:	Claims	

2. Citations and explanations
see separate sheet

Re Item IV

The following two groups of inventions have been identified in this international application:

1. Claims: 1-7

Method of cleaning filtering membranes immersed in a tank comprising the steps of draining the tank and backwashing the membranes with a chemical cleaner while the tank water is below the level of the membranes in repeated pulses.

2. Claims: 8-17

Method of cleaning filtering membranes normally immersed in a tank comprising the steps of backwashing the membranes with a chemical cleaner while draining tank.

Re Item V

1. Reference is made to the following documents:

- D1: PATENT ABSTRACTS OF JAPAN vol. 1997, no. 07, 31 July 1997 (1997-07-31) -& JP 09 075689 A (MITSUBISHI RAYON CO LTD;MITSUBISHI RAYON ENG CO LTD; S L:KK; INAX CORP), 25 March 1997 (1997-03-25) -& DATABASE WPI Derwent Publications Ltd., London, GB; AN 1997-239832 XP002153239 (*)
- D2: US-A-5 403 479 (SMITH BRADLEY M ET AL) 4 April 1995 (1995-04-04) cited in the application
- D3: FR-A-2 741 280 (OMNIUM TRAITEMENT VALORISA) 23 May 1997 (1997-05-23) cited in the application

(*) a computer translation of D1 has been appended to the written opinion

- 2.1 D1 (see passages as highlighted in the Search Report) discloses a method for cleaning suction driven filtering membranes immersed during permeation in tank water (see paragraphs [0010] and [0011]). The membranes are cleaned by backwashing with a chemical cleaner after draining the tank water from the tank (see paragraphs [0011] and [0014] - [0017]). It is clear that the tank is refilled and

that permeation is resumed after said cleaning.

In one embodiment of D1 (see claim 2 and paragraphs [0020] and [0021]) the chemical cleaner (designated as "medical fluid" in the computer translation of D1) is not applied continuously, but intermittently by opening and closing valve 18 a number of times (compare to present application on page 12, lines 11-12). Said method of backwashing with a chemical cleaner as described in D1 is thus considered to be a method of backwashing in repeated pulses, within the meaning of the present invention (see step (c) of claim 1: "... in which the chemical cleaner is delivered to the membranes separated by a time between pulses in which chemical cleaner is not delivered to the membranes"). Stated otherwise, the general term "in repeated pulses" cannot be used to distinguish the present invention from the prior art D1.

Consequently, the subject-matter of independent claim 1 is not novel with respect to D1 (Art. 33(2) PCT).

- 2.2 Independently from the objection made under point 2.1 above, the solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT).

The reason being that "in repeated pulses" cannot be regarded as an inventive contribution to the art of chemical backwashing since it is common practice in the field of backwashing immersed membranes with a chemical cleaner (see e.g. D2, passages as highlighted in the Search Report) and is simply an equivalent for the method of backwashing with a chemical cleaner as described in D1 and can be interchanged with that feature where circumstances make it desirable.

- 2.3 Furthermore, D1 discloses that the "holding time" should be insufficient to allow the membranes to dry (see paragraphs [0023] and [0024]). A time of 5 minutes has been mentioned explicitly in D1.

D1 (see paragraph [0019] discloses also that in case hollow fibre membranes are backwashed with a chemical cleaner, the conditions should be such as to counteract the differences in pressure which exist in the longitudinal direction of

the hollow fibres. A pressure of 1 to 4 m water column is applied (see paragraph [0017]), corresponding exactly to 10-15 kPa (approximately 1 to 5.5 m water) as mentioned in the present application on page 9, line 6.

Consequently, the subject-matter of dependent claims 4 and 5 is also known from D1.

- 2.4 The additional features of dependent claims 2, 3, 6 and 7 are well-known in the art and/or come within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can be readily contemplated in advance. See in particular D1, paragraph [0019] and D3 (see passages as highlighted in the Search Report).
- 3.1 According to another embodiment of D1 (see paragraphs [0032] to [0040]) chemical backwashing is performed while the tank is being drained (see in particular paragraph [0038], where it is mentioned *expressis verbis* that chemical cleaning (by backwashing) is applied while the precessed liquid is being discharged).
- 3.2 D1 also discloses the combination of the embodiments discussed under points 2.1 and 3.1 above.
- 3.3 Consequently, the subject-matter of independent claim 8 and dependent claims 10, 12 and 13 is also not novel with respect to D1 (Art. 33(2) PCT).
- 3.4 The additional features of the dependent claims 9, 11, and 14-17 are well-known in the art and/or come within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can be readily contemplated in advance.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 4320-86	FOR FURTHER ACTION <small>see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.</small>	
International application No. PCT/CA 00/ 00875	International filing date (day/month/year) 27/07/2000	(Earliest) Priority Date (day/month/year) 29/07/1999
Applicant ZENON ENVIRONMENTAL INC. et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☒ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1
☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CA 00/ 00875

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of th first sheet)

The abstract is changed as follows:

Line 2: after "membranes" insert "(24)";
Line 4: after "membranes" insert "(24)";
Line 6: after "membranes" insert "(24)";
Line 8: after "membranes" insert "(24)";
Line 9: after "membranes" insert "(24)".

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 00/00875

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B01D65/02 B01D65/06 C02F1/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B01D C02F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

PAJ, EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1997, no. 07, 31 July 1997 (1997-07-31) -& JP 09 075689 A (MITSUBISHI RAYON CO LTD; MITSUBISHI RAYON ENG CO LTD; S L:KK; INAX CORP), 25 March 1997 (1997-03-25) abstract; figures paragraphs '0005!', '0009!'-'0011!', '0014!'-'0017!', '0019!'- '0023!', '0027!'-'0046! -& DATABASE WPI Derwent Publications Ltd., London, GB; AN 1997-239832 XP002153239 abstract	1, 5, 8, 10, 13
A	---	2-4, 6, 7, 9, 11, 12, 14-17
	-/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

G document member of the same patent family

Date of the actual completion of the international search

17 November 2000

Date of mailing of the international search report

28/11/2000

Name and mailing address of the ISA

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Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
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Authorized officer

Hoornaert, P

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 00/00875

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 741 280 A (OMNIUM TRAITEMENT VALORISA) 23 May 1997 (1997-05-23) cited in the application abstract; claim 1; figures page 3, line 1 - page 6, line 15 page 8, line 4 - line 25 ----	1,2,8,11
A	US 5 403 479 A (SMITH BRADLEY M ET AL) 4 April 1995 (1995-04-04) cited in the application abstract; figures column 5, line 60 - column 6, line 34 column 11, line 21 - line 61 column 14, line 6 - line 40 column 17, line 1 - column 18, line 66 ----	1,4,8, 10,12
A	PATENT ABSTRACTS OF JAPAN vol. 1997, no. 02, 28 February 1997 (1997-02-28) -& JP 08 252438 A (MAEZAWA IND INC), 1 October 1996 (1996-10-01) abstract; figure 1 -& DATABASE WPI Derwent Publications Ltd., London, GB; AN 1996-492614 XP002153240 abstract ----	1,8
A	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 05, 30 June 1995 (1995-06-30) -& JP 07 047245 A (KURITA WATER IND LTD), 21 February 1995 (1995-02-21) abstract; figures -& DATABASE WPI Derwent Publications Ltd., London, GB; AN 1995-125636 XP002153241 abstract -----	1,8

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-7

Method of cleaning filtering membranes immersed in a tank comprising the steps of draining the tank and backwashing the membranes with a chemical cleaner while the tank water is below the level of the membranes in repeated pulses.

2. Claims: 8-17

Method of cleaning filtering membranes normally immersed in a tank comprising the steps of backwashing the membranes with a chemical cleaner while draining tank.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA 00/00875

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 00/00875

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 09075689 A	25-03-1997	NONE	
FR 2741280 A	23-05-1997	AT 185702 T AU 710229 B AU 7630096 A BR 9611625 A CA 2236840 A DE 69604818 D DE 69604818 T EP 0863793 A ES 2140914 T WO 9718887 A JP 2000500392 T PL 326935 A US 6045698 A	15-11-1999 16-09-1999 11-06-1997 28-12-1999 29-05-1997 25-11-1999 21-06-2000 16-09-1998 01-03-2000 29-05-1997 18-01-2000 09-11-1998 04-04-2000
US 5403479 A	04-04-1995	AU 1269795 A WO 9517241 A DE 69412647 D DE 69412647 T EP 0738180 A	10-07-1995 29-06-1995 24-09-1998 01-04-1999 23-10-1996
JP 08252438 A	01-10-1996	NONE	
JP 07047245 A	21-02-1995	NONE	